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# SPECIES MANAGEMENT GUIDE FOR

# Cypripedium fasciculatum

for southwestern Oregon:

Klamath National Forest (in Oregon)
Rogue River National Forest
Siskiyou National Forest
Umpqua National Forest
and
Medford District of the Bureau of Land Management

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# INTRODUCTION

The National Forest Management Act and Forest Service policy require that Forest Service land be managed to maintain populations of all existing native animal and plant species at or above the viable level. A viable population structure consists of the number of individuals adequately distributed throughout the species' range necessary to perpetuate its existence in natural, genetically stable, self-sustaining populations. For NFMA purposes, a species must be maintained throughout its range; with the unit of distribution being the National Forest. This means that the species must survive on every forest where it is currently extant to satisfy NFMA.

The Forest Service, along with other Federal and State agencies, has recognized the need for special planning considerations in order to protect some of the rare flora and fauna on the lands in public ownership. Species recognized by the Forest Service as needing such considerations are those that (1) are designated under the Endangered Species Act as endangered or threatened, (2) are under consideration for such designation (C1 or C2 candidates and Proposed species), or (3) appear on a Regional Forest Service sensitive species list.

Clustered lady's-slipper (Cypripedium fasciculatum) is a rare species which was formerly a candidate for listing under the Endangered Species Act. It is currently a 3C species, based on the most recent publication in the Federal Register (U.S. Fish and Wildlife Service 1985), indicating that the U.S. Fish and Wildlife Service no longer feels that it is likely to be listed due to increased abundance or limited threats. The species is on List 2 of the Oregon State list (Oregon Natural Heritage Data Base 1989), classified as "Threatened In Oregon But More Common Or Stable Elsewhere". The term "Threatened" is defined based on the definition from the Endangered Species Act, as:

> Threatened taxa are those which are in danger of becoming endangered within the foreseeable future throughout all or a significant portion of their range.

Cypripedium fasciculatum has also been described as rare and threatened in Oregon (Siddall, Chambers and Wagner 1979). In 1984, the California Native Plant Society (CNPS 1988) moved the species from their Rare and Endangered List (List 2) to their Watch List (List 4). This change in the species' status in California is the reason it was removed from the Federal Candidate Notice of Review. It is also considered as threatened or sensitive in Washington, Idaho, Montana, Wyoming and Utah. The status in Colorado is being re-evaluated, and the Colorado Heritage Program has indicated they are considering a sensitive or threatened species status in there.

The threats to this species include natural threats due to its very small average population size, and man-caused threats, due to logging and other alternate uses for its habitat.

The primary objective of this Management Guide is to outline a plan for managing Cypripedium fasciculatum in southwestern Oregon, on Siskiyou, Rogue River, and Umpqua National Forests and on the Medford District of the Bureau of Land Management, which will allow for the species' survival through time, and will reduce the need for its placement on the U.S. Fish and Wildlife Service list of endangered and threatened species. A secondary objective is to produce a plan which

would be compatible with (or could be used to update) the existing plan on the Klamath National Forest, as well as those used on the Shasta-Trinity and Plumas National Forests. Since Cypripedium fasciculatum is a sensitive plant on many other National Forests in Regions 6, 1, 2, and 5, this plan can also provide a model for plans in other regions.

Special management is recommended because the plant occurs regularly in proposed timber sales, but usually in populations consisting of only a few plants. Due to the large numbers of populations, conflicts occur regularly. A species management guide for this taxon will allow for prudent planning, and also allow the Siskiyou, Rogue River and Umpqua to limit their searches for this plant.

This guide is divided into two sections. The first section provides the most recent information on the range, distribution, population biology, and habitat requirements of Cypripedium fasciculatum. The second section identifies management practices consistent with the species' needs, including the identification of essential monitoring needs.

## BIOLOGICAL INFORMATION

### Plant Description

Cypripedium fasciculatum is a distinctive orchid which is easily identifiable in flower and fruit. It is unique among the Oregon Cypripediums in having leaves which appear to be opposite (they are actually subopposite, joined to the stem almost but not exactly in the same spot). The only other taxa which could be confused with C. fasciculatum are Listera species, which occur in the same habitat, but could only be confused if they were non-flowering populations. Listera tends to be significantly less hairy, taller and more slender than C. fasciculatum, but care should be taken not to mistake sterile individuals.

Cypripedium fasciculatum was originally described in 1882, based on a specimen collected by Suksdorf "On the White Salmon River above the falls". In 1906, Cypripedium knightae was described by A. Nels. (Bot. Gaz. 42:48. 1906), from a plant collected at Cooper Hill, in the Medicine Bow Mountains of Wyoming in 1905. The two species have been merged, and there has been consideration of describing C. knightae as a variety or subspecies. ("Rocky Mt. plants seem to differ from those of Washington, Oregon, and California in having smaller flowers and leaves and much shorter pubescence on the ovaries, and very possibly represent a geographic race. With the meager material on hand for comparison, I hesitate to propose the appropriate infraspecific epithet for them, but do not believe they are maintainable as a separate species, C. knightae A. Nels." (Hitchcock et al., 1969, p. 883, Volume 1, U.W. press). A recent paper by Brownell & Catling (1987) found that none of the characteristics described are useful in distinguishing the Rocky Mountain from the west coast races, and no infraspecific names were proposed. They did find differences in the size of the plants, flowers and leaves, but there was too much overlap to allow their separation as subspecies.

Technical descriptions of Cypripedium fasciculatum can be found in all of the local floras: Peck (1961), Hitchcock et al. (1969), Munz & Keck (1968), and Abrams (1961). The following description, as well as the illustration included as Figure 1, are from Hitchcock et. al (1969).

> Cypripedium fasciculatum Kell. ex Wats. (Clustered Lady's slipper). Plants perennial, stem 0.5-2 dm. tall, lanate-pilose, usually with a single sheathing bract near ground level, a pair of opposite leaves at to well above midlength, and often 1 or 2 lanceolate bracts near the inflorescence; obtuse to slightly acute; flowers (1) 2-4 in a rather tight cluster, subtended by conspicuous greenish bracts usually as long as the densely pilose ovary; sepals lanceolate-acuminate, 12-25 mm. long, greenish-brown or greenish-purple and usually purple-lined or -mottled, the lower pair fused completely or free at the tips only; petals similar to the sepals but usually somewhat broader; lip depressed-ovoid, shorter than the sepals, greenish-yellow with brownish-purple margins and often with purplish tinge; staminodium 2.5-3 mm. long, about equalling the longest lobe of the stigma.

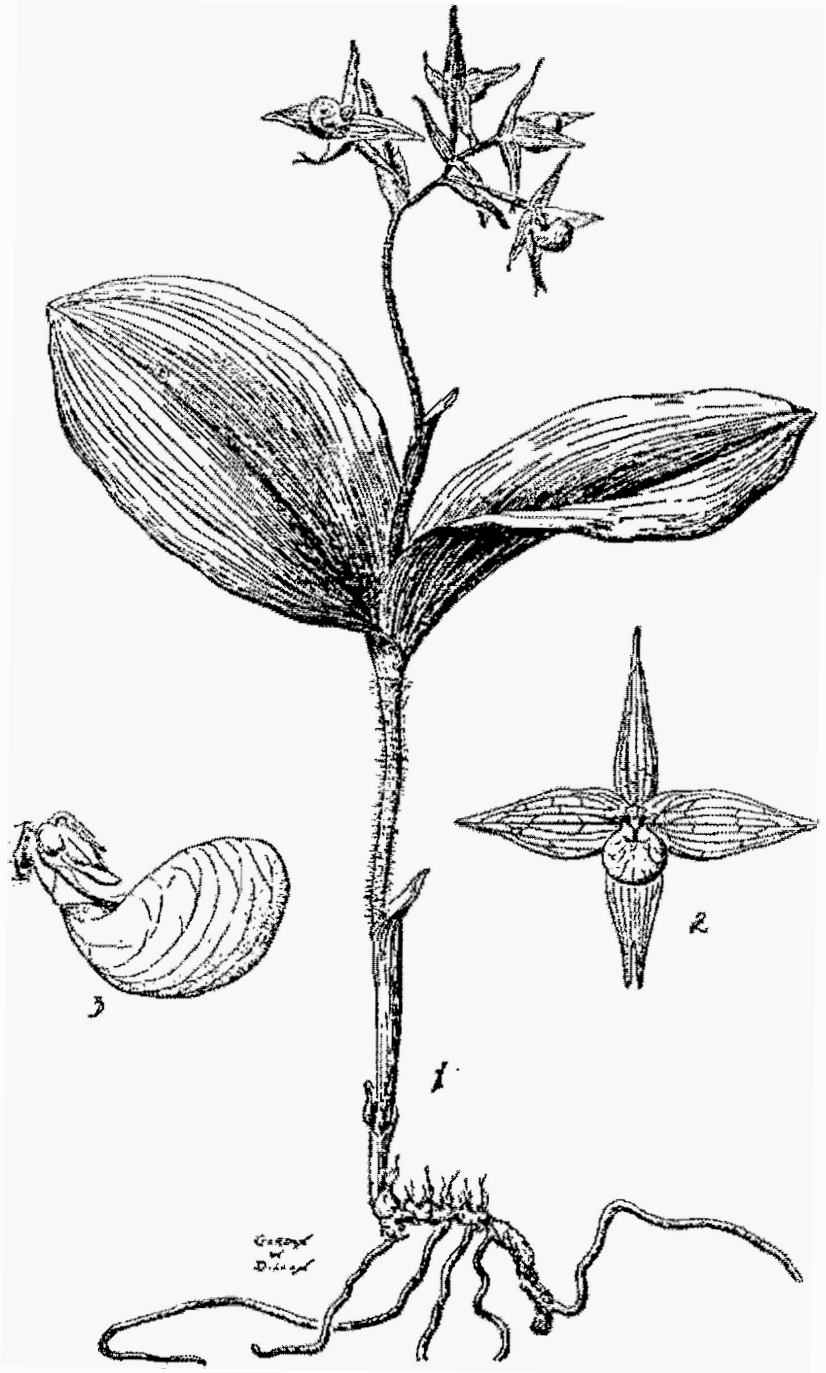


PLATE 6.—Cypripedium fasciculatum. 1, plant, one half natural size. 2, flower, front view, spread out, natural size. 3, lip and column, side view, three times natural size. *Drawn by Gordon W. Dillon.*

Figure 1. Line drawing of Cypripedium fasciculatum from Correll, D.S. (1950)

Range and Distribution

Cypripedium fasciculatum has a widespread range, which may have led to an unsubstantiated belief that it is a fairly secure taxon. The plant is found in coniferous forests in California, Oregon, Washington, Idaho, Montana, Utah and Colorado. It is reported to occur in southern British Columbia by the floras (Hitchcock et al. 1969) but apparently no longer occurs there, or was incorrectly reported as having occurred there (Brownell & Catling 1987).

There are two so-called races of Cypripedium fasciculatum; the coastal race which includes all of the plants in Washington, Oregon (with the exception of the Wallowa County collection), and California, and the Rocky Mountain race which includes the Idaho, Montana, Utah, Wyoming and Colorado plants. There are four centers of distribution within each of these races. In the Rocky Mountain race, plants occur in northern Idaho, Montana, Utah and the Wyoming-Colorado border area. In the coastal race, plants are centered in eastern Washington, the Siskiyou-Klamath Mountains of southwestern Oregon-northwestern California, in the northern Sierra Nevada Mountains, and in the Santa Cruz Mountains of central coastal California.

In spite of its large range, it has a patchy distribution, and appears to be rare throughout its range. It is considered rare and threatened in all states, except for California, which probably has more occurrences than any of the other states.

In Colorado, it is currently known from about 25 occurrences, with an average population size of about 20 plants (Bill Jennings, personal communication). Wyoming estimates fewer occurrences which are equally small. Since not all populations are tracked by the Wyoming and Colorado Heritage Programs, there are probably more, undiscovered populations, but there are not likely to be more than 2000 or so plants found in this center of distribution.

In Utah, it is known from the Uinta and the Wasatch Mountains. The Uinta Mountain occurrences were found this year, and include three large, healthy populations numbering over 500 individuals. These are in lodgepole pine (Pinus contorta) forests at about 8000 feet in elevation, which is extremely different from those at the other sites which occur at moist sites at lower elevations. The populations in the Wasatch Range are typical of the other Rocky Mountain sites, occurring in mid-elevation, sub-alpine fir (Abies lasiocarpa) forests.

In Idaho, there were also a number of new, but very small populations discovered this year. There are a total of 28 known populations in the state, with an average of two to five plants per population. Of the 28 populations, there is only one with over 30 plants, while the rest have fewer than 12 individuals. They tend to occur in very small patches in low elevation mixed conifer forests (Douglas fir {Pseudotsuga menziesii}, western hemlock {Tsuga heterophylla} and western red cedar {Thuja plicata}). The total population in Idaho is estimated to be less than 500 individuals.

The Washington state plants occur primarily in mature Douglas fir forests on the east side of the cascades. There are at least two populations which were discovered during the 1990 field season, for which no numbers are available - although one of these is likely to be the largest known from the state. Overall, there are 20 known populations, which include a total of about 650-700 plants. One of the newly discovered populations is reported to have several hundred plants. In addition to this

population, there are three other populations in Washington with over 100 plants, which appear to be reproducing and which may be stable. Otherwise, most of the populations have between two and 20 individuals.

In California, it is most abundant in the Siskiyou-Klamath area. It was removed from the U.S. Forest Service's sensitive species list for the California Region 5 (and probably from the CNPS list as well) based on a 1982 Species Management Guide written by Linda Barker for the Klamath National Forest. In this region there are approximately 50 known populations, all on the Klamath or Shasta-Trinity National Forests. The total number of plants is estimated to be about 2000 for this part of California. There are about 80 occurrences known from the Sierra Nevada in California, most of which are on federal lands administered by the Plumas National Forest. Of these, nine have populations of more than 50 plants, and one has a very large population (approximately 2000 plants). The large populations have been protected, making this area the largest and most secure portion of Cypripedium fasciculatum's range. There are only five historic collection sites from the Los Padres National Forest area of the Santa Cruz Mountains. No new information on the status of Cypripedium fasciculatum in this area has been obtained.

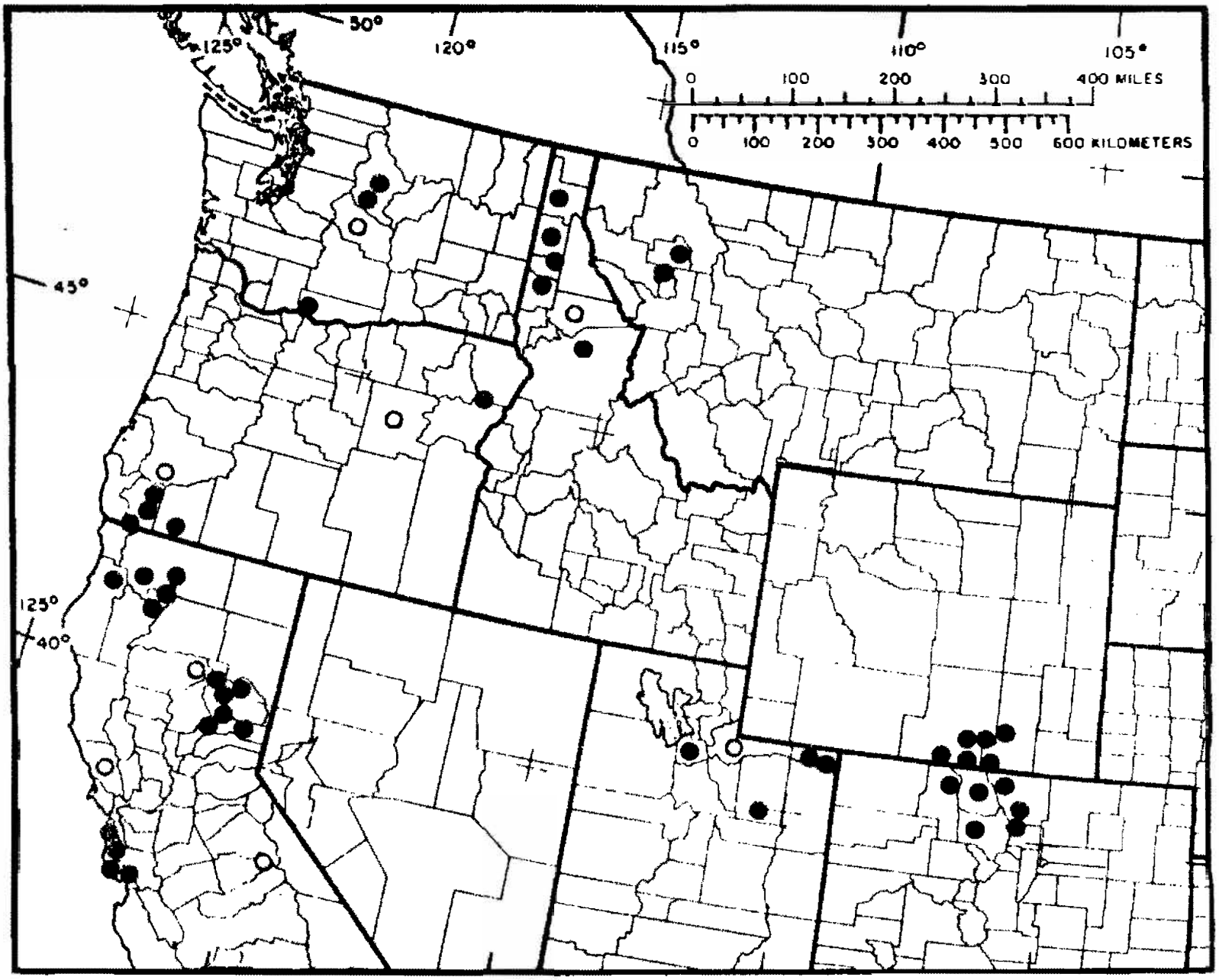
The Oregon population is extant only in the southwestern portion of the state. Cypripedium fasciculatum has been collected twice from northeastern Oregon, in or near the Wallowa-Whitman National Forest and once from the Malheur National Forest. None of these has been relocated during the last 30 years. In 1990, one Cypripedium fasciculatum plant was discovered on the Umatilla National Forest in Washington, just across from the Oregon border.
The majority of this report will focus on the status of Cypripedium fasciculatum in southwestern Oregon. There are about 50 known occurrences of the species in southwestern Oregon. All but one of these populations occur within the Rogue River basin, and the majority of them are in the Applegate River drainage. Most of the populations in southwest Oregon occur on federal lands administered by the Rogue River National Forest and the Medford District of the BLM.

A map of the total distribution of this species, is included as Figure 2 (page 7). An enlargement of the Oregon occurrences are included as Figure 3 (page 14), with the separate distribution areas (see management plan).

## Habitat Description

The habitat for Cypripedium fasciculatum is described as coniferous forests in all of the floras. Given the wide range of the species, the habitat is quite variable. In Idaho, Montana and eastern Washington, the habitat includes Ponderosa pine (Pinus ponderosa) and Douglas fir forests. In Utah, Colorado and Wyoming it occurs in higher elevation spruce-fir forests.

In southwestern Oregon, the plants occur primarily in Douglas fir forests. The Oregon populations tend to occur in fairly moist, shaded sites, which have some soil present. Almost




Distribution of *Cypripedium fasciculatum*, based on specimens in U. S. herbaria (dots) and additional literature reports (circles).

Figure 2. Range Map of Cypripedium fasciculatum

all populations are on north facing slopes or benches, at moderate elevations, ranging from 1000 to 3500 feet.

There are two main types of habitats in which Cypripedium fasciculatum occurs in southwestern Oregon. The most important of these, in terms of overall plant numbers, is old-growth Douglas fir forests on low to moderate elevation stream terraces. These are characterized by having some western dogwood (Cornus nuttallii), a tree which is not extremely common in southwestern Oregon. The second is Douglas fir-Madrone (Arbutus menziesii) forests, on north slopes. These habitats are also somewhat different in the different areas in southwestern Oregon, and are discussed separately.

1. Southwest Oregon Cascades

Cypripedium fasciculatum has been collected from five different locations in the southwestern Oregon Cascades. The most northerly collection is also the only large collection site.

Diane White, the ecologist from the Umpqua National Forest, provided a printout with all vegetation types described by Atzet and Wheeler from the Cascade province that contain western dogwood. Thirty-two plant associations included western dogwood, but only one had 100% constancy, and this is the habitat type in which the two large U.S. Forest Service occurrences were found in: TSHE/ACMA/POMU (western hemlock/bigleaf maple/swordfern association), a typical river terrace or moist slope type. (This type usually is dominated by old, Douglas firs, in spite of the name). In addition to this association, three other associations had western dogwood with constancy greater than 66%:

1. TSHE/GASH/HIAL (western hemlock/salal/hawkweed) - 85% constancy - 12% cover with madrone present.
2. ABCO/VAME/ACTR (white fir/bigleaf huckleberry/vanillaleaf) - 80% constancy - 7% cover
3. PSME/RHDI/PTAQ (Douglas fir/poison oak/bracken fern) - 80% constancy - 7% cover with madrone present

Of these, the last is a hot and dry forest type, and seems unlikely to contain Cypripedium fasciculatum. The other two associations have the potential for Cypripedium fasciculatum populations, but no extant sites are known from them as yet. The plants have been infrequently collected in the Cascades, and therefore habitat information is limited.

2. The northern Siskiyous in the Rogue River Canyon

There are only two collection sites for Cypripedium fasciculatum in this area, but they are significant because they are the largest populations in Oregon, and perhaps in the world for this species. Both are fairly low elevation plant associations, which occur on river or stream terraces. One is on the Siskiyou National Forest, one on the Medford District of the BLM. Both are dominated by Douglas fir, have some oak (Quercus garryana), maple (Acer macrophyllum), and are characterized by the occurrence of dogwood (Cornus nuttallii) and hazel (Corylus cornuta).

3. The southern Siskiyou Mountains.

This is the largest and most complex ecological area with Cypripedium fasciculatum populations. Approximately 50 occurrences are known, primarily in the Applegate and Ashland Districts of the Rogue River National Forest, and the adjacent properties managed by the Medford District of the BLM. These tend to be low to mid elevation sites, with the largest occurrences occurring down low. The majority of sites occur in old-growth Douglas fir forests with some western dogwood present, or on Douglas fir-madrone forests.

None of the plant associations from the Siskiyou National Forest described in Atzet (1984) have a high constancy of western dogwood. Three white fir associations, white fir-pacific yew (ABCO-TABR), white fir-Douglas fir (ABCO-PSME), and white fir-Rocky Mountain maple (ABCO-ACGL) have some dogwood present, and these represent the typical mid to high elevation sites for Cypripedium fasciculatum in this area. The only low elevation association with dogwood is the Douglas fir/dwarf Oregon grape (PSME/BENE) association, which is described from the Applegate and Illinois Ranger Districts, and also found on the intervening BLM lands. This type also presents high potential as Cypripedium fasciculatum habitat.

The populations occurring in madrone and Douglas fir habitats are more numerous and diverse, although plant numbers are always small in these areas. They include the following types:

1. PSME-LIDE3-PILA (Douglas fir--tan oak--sugar pine)
2. PSME-LIDE3-QUCH (Douglas fir--tan oak--canyon live oak)
3. PSME/BERE (Douglas fir/creeping Oregon grape)

Three other types have significant amounts of madrone: PSME-LIDE3/RHDI (Douglas fir-tan oak), PSME/RHDI-BEPI (Douglas fir/poison oak-Pipers Oregon grape), and PSME/RHDI (Douglas fir/poison oak). However these are drier types, characterized by poison oak (Rhus diversiloba), which usually does not occur with Cypripedium fasciculatum. In addition, other associations with madrone occur primarily on southerly or westerly aspects, have shrubby understories, or have other factors inconsistent with the occurrence of Cypripedium fasciculatum.

In this area, undisturbed stream terraces are extremely rare, and most of the populations occur on the slopes above. Individuals and small populations are found on north facing slopes from the bottom to just below low elevation ridges.

## Population Biology

### -Population Structure and Viability-

Little is known about the population biology of Cypripedium fasciculatum. A summary of population biology information for orchids is included in Harper (1977). It includes studies on long term survival of Spiranthes on a reserve in England (Wells 1967), and demography information of orchid population in experimental plots (Tamm 1972).

The size of the majority of the populations Cypripedium fasciculatum, and the apparent lack of reproduction are major concerns. As mentioned earlier, most of the known populations of Cypripedium fasciculatum are quite small. In Oregon, there are currently 48 known occurrences. If the one very large population at Taylor Creek is excluded, the average population size is about 20 plants, although most of the populations consist of only 2-7 plants. This would indicate that there are about 1000 plants at all of the populations in Oregon except for the Taylor Creek site, and a total of 2000 plants including the Taylor Creek site.

The small populations tend to show no reproduction. None of the sites visited with populations of fewer than ten individuals showed any small plants or seedlings. Most of the populations had been discovered in inventories from 1980-1985, and population numbers had not changed in any of them. The plants were often flagged, and preliminary surveys indicate that the same plants were often present in 1990 which had first been seen in 1980. In none of the revisited sites were there any population increases.

About half of all plants observed flowered in 1990. The flowers are brown, low to the ground, and appear to be beetle pollinated. No insects were observed visiting any of the flowers. Of the flowering plants, all produced fruits, except for plants which had the flowers or fruits eaten (browsed) by deer or other herbivores. The percentage of plants showing deer browse damage varied between the populations, but overall, between a third and one half of all flowers were damaged and did not produce fruit. None of the ovaries was examined to check for seed set. Cypripedium species typically produce large numbers of seeds, which can be widely disseminated due to their very small size. Orchid seeds tend to be quite perishable (possibly due their small size) and must establish fungal contact quickly or die (Julie Kierstead, personal communication). Nothing has been published about seed viability or dispersal in Cypripedium fasciculatum.

-Germination Requirements-

Linda Barker (1984) discussed germination in her species management guide. In order for seed germination and establishment to be successful, a fungal relationship must be established for nutritional purposes. (Orchid seeds tend to lack endosperm, having only a seed coat and an embryo.) "As a group, orchids are notable for their very gradual vegetative development from seed, as they require a mycorrhizal (or parasitic) association for several months or years before autotrophic tissues are formed...Consequently, many orchids do not flower for many years after germination, e.g. Listera ovata, Spiranthes spiralis, and Cypripedium calceolus which require 12 to 16 years growth before flowering" (Harper, 1974). Failure to establish these mycorrhizal relationships may be reflected in limited population sizes.

An interesting observation regarding the Oregon populations, was that large, dead Douglas fir snags were always present in the populations of Cypripedium fasciculatum which had small plants present, and were reproducing. Although it is only speculation, it is possible that the seeds require a mycorrhizal fungus for germination which occurs in old-growth Douglas fir forests, or which occurs with dying Douglas firs, or perhaps one which has a relationship with madrone or western dogwood, the two most common habitat indicators. The largest population, at Taylor Creek, is in a site which had a partially catastrophic fire about 75-100 years ago. The site has a number of standing dead old fir snags, as well as many old and fairly marginal trees. The other large populations also appeared in

areas which had burned and showed some Douglas fir mortality in the recent past. This has not been observed in any of the populations elsewhere.

-Fire Ecology-

There is little doubt that Cypripedium fasciculatum's historical distribution and population biology has some relationship to wildfire in southwestern Oregon and northwestern California. Wildfire is a critical determinant of the species composition, stand structure and canopy cover of almost all of the forests in this region. In 1987, a series of hot fires burned through many areas in this region. In California, three of the largest populations of Cypripedium fasciculatum were burned in these wild fires. These, and all other known populations in wildfire areas, appear to have disappeared following the fires. No specific information is currently available on the nature of the fires as they affected the specific microsites on which the Cypripedium fasciculatum plants occurred. The plants may have been destroyed by the fire, or they may not have been able to survive without soil duff, shade, or some other factor removed by the fire.

It seems highly unlikely that Cypripedium fasciculatum populations could not survive an underburn of the type that was most common in presettlement times. However, given the fire suppression of the last 4 or 5 decades, perhaps fuel loads have increased in these habitats to levels which support hot fires which destroy these local populations.

## Threats

### Natural Threats

Due to the rarity of this taxon and its patchy local distribution, it may be threatened by natural features that would not normally be significant. Most of these are outside of the control of land managers, but should be mentioned to allow for emergency measures if plant numbers become too low.

1. Predation: All plants are susceptible to insect infestations and predation. Plants were often observed to be browsed by deer or other native herbivores. In all populations, individuals were observed to have their seed capsules removed by herbivores, often with between half and three-quarters of the population affected.

2. Poor Reproduction: Cypripedium fasciculatum appears, like all taxa in the group, to require a fungus to aid in germination. It appears likely that the fungal associate in Oregon is an endophytic or mycorrhizal species which is associated with large or dying Douglas fir trees. Regardless of the type of fungus, germination or reproduction of this species seems to be limiting. Because of this most of the populations appear small, and most have no evidence of reproduction. The plants appear to be long-lived, but without evidence of reproduction, can not be considered to be viable occurrences. Changes in climate or microsite moisture levels may be partly responsible for the limited germination or seedling survival.

Human-Related Threats

Human related threats to Cypripedium fasciculatum are more serious than the natural threats and more difficult to deal with.

1. Timber Harvest: Cypripedium fasciculatum occurs in mature forests, and is usually found as a result of presale sensitive species clearance inventories. Populations are usually small, but modification of timber sales cause continual conflicts and difficulties for timber planners, district rangers, and others in the Forest Service. In the past, some timber sales have been modified, others cut without modification, and others totally stopped. In the sites with modified or unmodified sales which were logged, no pre or post sale monitoring occurred, outside of the initial inventory work. As a result, it has become difficult to assess the status of this taxon because of the unclear status of many of the populations.

Since Cypripedium fasciculatum requires moist, shaded wood, it is assumed that it will not survive a clearcut timber operation. In areas with modified sales, plants have survived, provided the sale did not significantly alter the habitat of the plant by decreasing shading, or altering the hydrology or summer moisture levels. In sales where no buffer was provided around the population, populations have disappeared. In California, on the Plumas National Forest, as part of an experiment, an area with a small population was clearcut, and treated as if no sensitive species were present. None of these plants survived. However, individual Cypripedium fasciculatum plants have been observed to survive selective logging in other regions (Bill Jennings personal communication from Colorado), although whether plants can reproduce after selective cutting and therefore persist over time is currently unknown.

Cypripedium fasciculatum apparently responds differently to selective cutting. Plants have been found in a number of areas which have been high-graded, or have had some selective logging. In areas personally visited by the author, remaining plants always are found within a short distance to old-growth trees, and often within a short distance of large snags or dying trees. This is apparently not true for all populations, especially those occurring in madrone (Arbutus menziesii) dominated habitats.

## MANAGEMENT PLAN FOR CYPRIPEDIUM FASCICULATUM IN SOUTHWESTERN OREGON

### Population Objectives

This plant occurs in many small, isolated populations throughout the coniferous forests of southwestern Oregon. These populations tend to be centered in a few areas, with a few truly isolated populations. The goal of this plan is to maintain populations of Cypripedium fasciculatum over time throughout its current range in southwestern Oregon.

For the purposes of this plan, the current range of Cypripedium fasciculatum will be treated based on the major areas in which the plant occurs. Whenever possible, these will be associated with Forest Service or BLM management units. The objective is to maintain two to five viable populations within each of these population areas, with five populations as the long term goal. The main population areas are:

1. Illinois Valley and Slate Creek area (including parts of the Illinois Valley Ranger District and BLM Medford District lands).

2. The Applegate River drainage (including most of the Applegate Ranger District, the eastern portions of the Ashland Ranger District in the Little Applegate drainage, and the adjacent lands owned and managed by the Medford District of the BLM).

3. The Klamath River Drainage portions of southern Oregon (including Klamath National Forest and Medford District BLM lands, which are largely out of the scope of this report).

4. The Ashland-Talent foothills (the Bear Creek drainage including the northern parts of the Ashland Ranger District and the adjacent lands managed by the Medford District of the BLM).

5. The southern Cascade Mountain foothills (including the areas north and east of Medford and south of the Rogue-Umpqua Divide, primarily on the Prospect and Butte Falls Ranger Districts and the adjacent BLM lands).

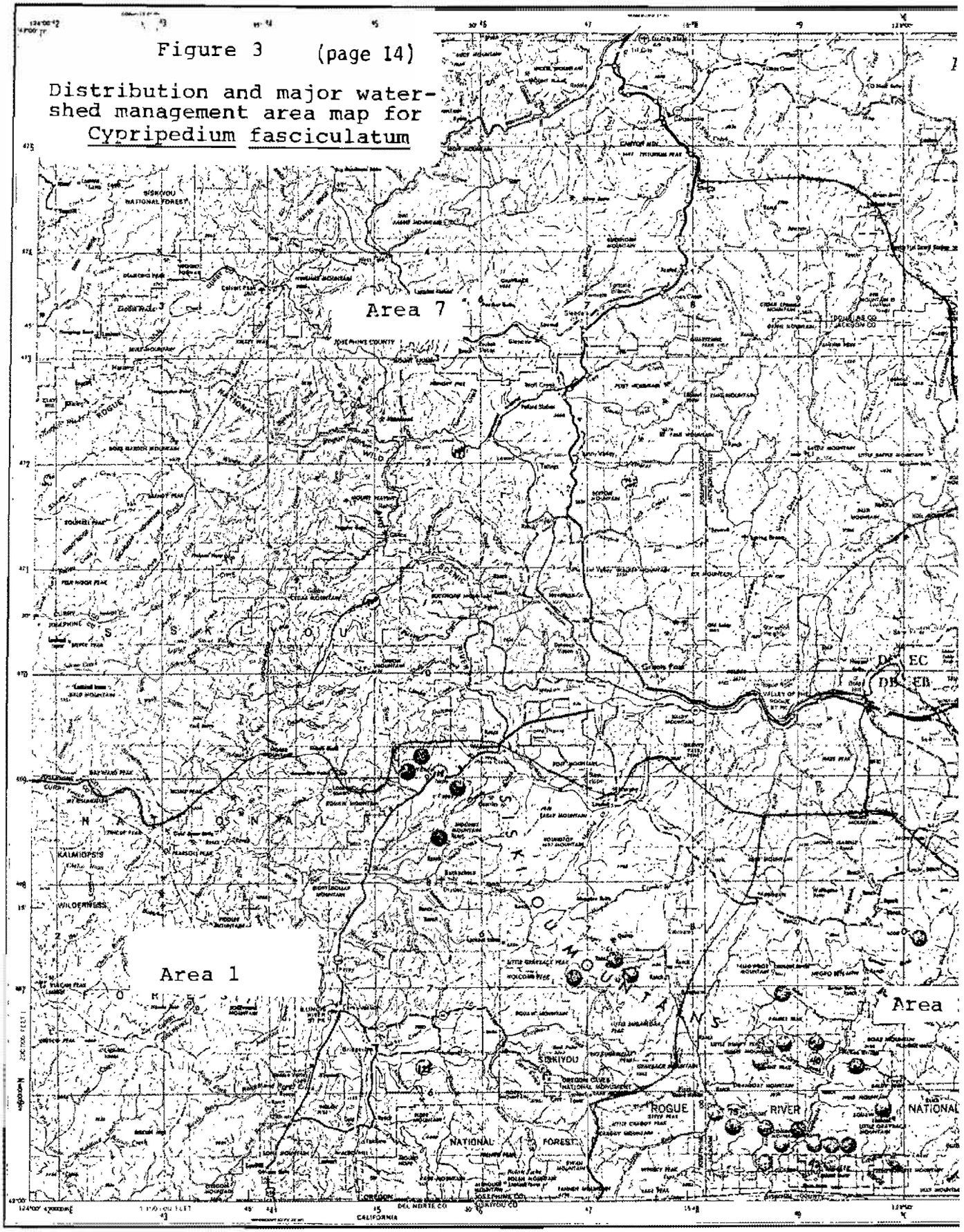
6. The lower Rogue River drainage area (managed by the Galice Ranger District and the BLM Medford District).

7. The Umpqua River Drainage portions of the southern Oregon Cascades (primarily on the Umpqua National Forest).

The species occurs most frequently in populations of only two to seven individuals, with little evidence of reproduction. Occasionally, larger populations, with more than 50 plants, have been located. "Populations" of two individuals which were located in 1980 timber sale inventories, were often relocated in 1990, indicating that small populations (or more likely individual plants) persist over time. However, none of the small populations seen in 1980-1985 were observed to increase in number by the 1990 recheck.

Figure 3 (page 14)

Distribution and major watershed management area map for Cypripedium fasciculatum




LEGEND

POPULATED PLACES
Over 100,000 LOS ANGELES
100,000 to 100,000 OMAHA
25,000 to 100,000 GALVESTON
5,000 to 25,000
1,000 to 5,000
Less than 1,000
Rural Routes

BOUNDARIES
International
State
County
Park or reservation

ROADS
Primary, all weather, hard surface
Secondary, all weather, hard surface
Light duty, all weather, hard or improved surface
Poor or dry weather, unimproved surface
Trail
Interstate route number
U.S. route number
State route number
Landmark airport
Landing area
Seaplane anchor
Dry lake
Woods trail/fire break

Mine
Locality or mine group
Spot elevation on road
Marker or cairn
Intermittent or dry stream
Water line

Scale 1:250,000

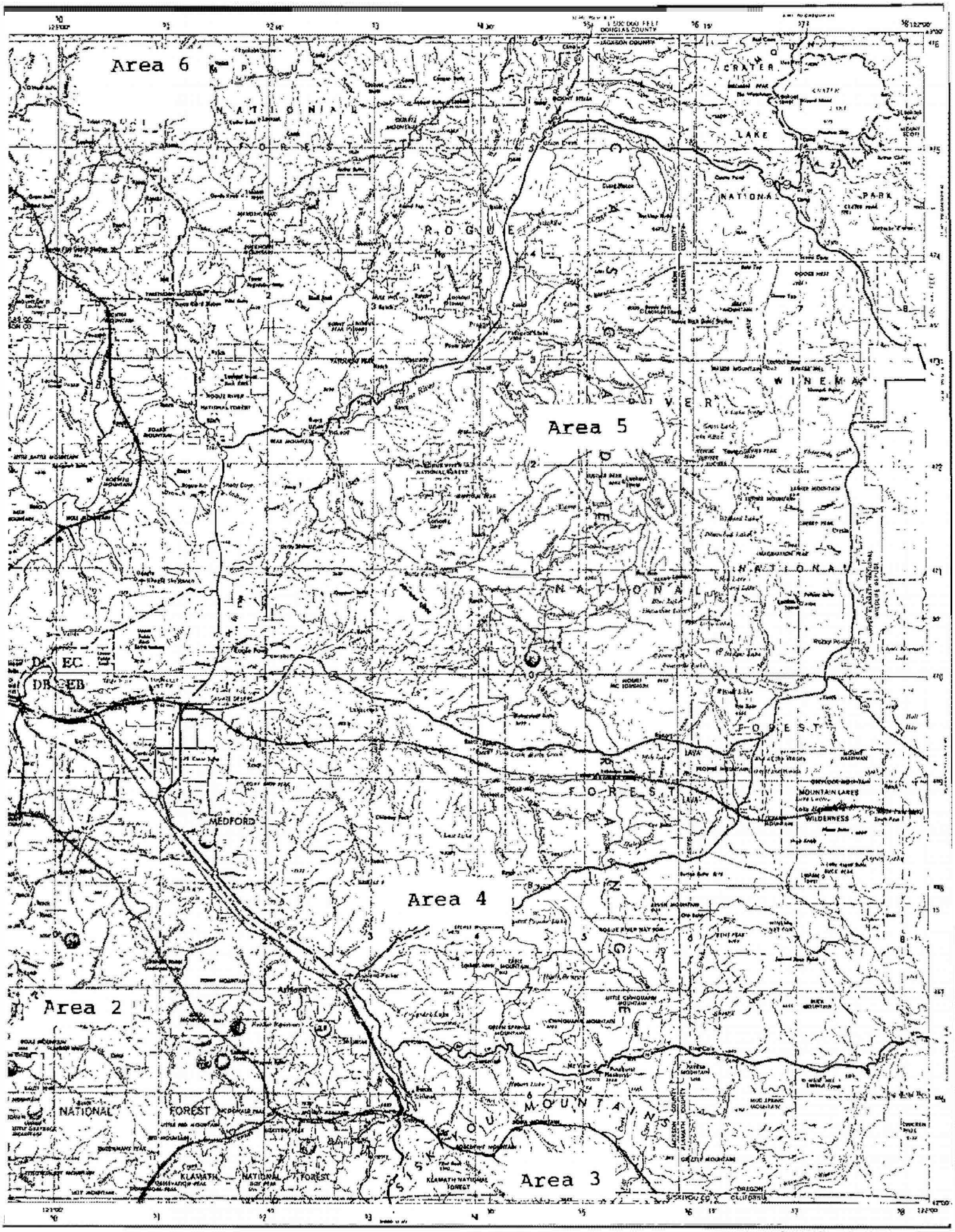
CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FE
TRANSVERSE MERCATOR PROJECTI

BLACK NUMBERED LINES INDICATE 1000 METER UNIVERSAL TRANSV

FOR SALE BY U S GEOLOGICAL SURVEY, DENVER COLORADO

MEDFORD

NK 10-5




CONTOUR INTERVAL 200 FEET
DOTTED CONTOURS AT 100 FOOT INTERVALS
TRANSVERSE MERCATOR PROJECTION

DENVER, COLORADO 80225 OR RESTON, VIRGINIA 22092

MEDFORD, OREGON; CALIFORNIA

1955

REVISED 1976

Therefore, the objective of this plan is to have five populations which appear viable (having 50 or more plants and showing some reproduction), in each of the seven population areas. Since this is currently not possible, any population of 20 or more individuals, which shows evidence of reproduction and appears viable, will be considered to be a viable population. However, the goal of the guide is to attain the five populations of 50 or more plants within each area, so that 20 plant populations (or the best available populations in an area) will be treated as interim protection.

A second, associated goal, is to achieve a minimum population size within each of the areas. With 50 plants per population and five protected sites, a total of 250 plants would be the minimum number acceptable based on the sites. However, a goal of 500 plants in the five protected populations is the goal of this guide. To accomplish this, the populations of one or more of the protected sites would have to be larger than the 50 plant minimum. This second goal could be reached with one large population of 500 plants in an area, or with five populations of 100 plants each.

The final goal is to assure that plants remain as widely distributed throughout the areas as is possible. Therefore, if additional large reproducing populations are discovered within an area with 5 previously protected populations, the new ones should be substituted for the protected sites if they provide better distribution for Cypripedium fasciculatum within the area. Also, any newly discovered, large and viable populations can be substituted for existing protected populations if they are determined to be more viable or more defensible.

In an area with two or more large, viable, protected populations of Cypripedium fasciculatum (50 or more plants), additional small, non-viable occurrences (occurrences with 1-10 plants which are not reproducing) can be ignored (provided the overall total of five protected populations in the area has been met). Newly discovered large populations should be exchanged for the small ones, until a total of five, large, viable populations are protected within each area. Once five populations are protected within an area, any additional populations can be ignored, provided that the overall goal of 500 plants in the area is also reached.

The long-term maintenance of the large, viable, protected populations is critical if this plan is to succeed. Therefore these populations must be totally protected. This means none of the characteristics of the site should be changed. Any actions to areas adjacent to the protected sites should include appropriate buffers to assure canopy security, no changes in light filtration, and no hydrologic or site moisture changes. In some instances, only minimal buffers may be required. In other cases, such as sites with populations occurring at the bottom of unstable slopes, the entire area up to the ridge may need to be protected in order to adequately protect the population.

-Summary-

1) Southwestern Oregon is divided into seven areas based on watersheds and ownership. The goal is to maintain populations of Cypripedium fasciculatum in each of these areas over time.

2) Five populations which are viable (reproducing) and large (over 50 plants if possible), with a total of 500 plants, need to be protected in each area.

3) Once two viable (reproducing) populations are protected in an area, all small (less than 15 plants) or non-viable (not reproducing) populations of Cypripedium fasciculatum can be ignored. These are suitable for experimentation, or standard management, since they do not provide for the long term maintenance of this species in southwestern Oregon.

4) Once five large, viable populations are protected in an area, additional large populations discovered will be examined to determine if they provide better distribution, or more viability; and if so, they can be substituted for one of the five protected sites. If possible, they should be examined to determine if they can help fill the population goals of an adjacent area, if they are near a population boundary. Whenever possible, additional, large and viable populations should be protected as a reserve in case of catastrophic loss of one of the five protected populations.

For the purposes of this plan, the Selected Populations will be discussed separately for each of the areas. This will allow only those Ranger Districts with populations within an area to be involved in Selected Population decisions.

## Management of the Protected, Selected Populations

All protected, selected populations will be managed primarily for the maintenance of Cypripedium fasciculatum. Based on existing data, if the population is currently large and viable, no active management should be required, although minimal monitoring should occur at each of the sites. At some of the smaller sites, with populations from 20 to 49 plants, enhancement may appropriate. In this report, details of potential management will be dealt with on a site by site basis.

## Management of Non-Selected Populations

Non-selected populations can be of two types. The majority will include small, isolated occurrences of one to five Cypripedium fasciculatum individuals. Since these do not appear to be viable populations, the management of the sites can be flexible, provided at least two reproducing sites are protected within the major area of southwestern Oregon. If the habitat includes stream terrace or other habitats which are similar to those of the larger populations in the area, they can and should be protected if possible. Orchids are always of interest to the general public, and if possible, management activities should be altered to prevent the destruction of these plants. Based on past experience, plants can survive some disturbance, provided minimal shading is maintained around them. While individual plants appear to survive selective logging, any logging apparently eliminates the potential for population recovery (Cypripedium fasciculatum reproduction) within the area.

Management of the larger (20 or more plants) populations which are not selected is a more difficult question. This would only be a consideration after the five selected populations were protected within an area. If large populations were located in an area with five protected sites, which were well distributed throughout the area, and the new location did not significantly add to the overall viability of the species in the area (because it is close to, smaller than and in similar habitat to one of the already protected, viable occurrences), then various options would be open to the manager. If any of the existing protected sites, or the newly discovered large population was near the boundary of one of the areas, and the adjacent area is lacking the 5 protected sites, one of the sites could be potentially used as a protected site in the adjacent area (the areas boundaries could be modified to aid in the protection of this species). If adjacent areas also have met the population goals of this plan, the population could be used as an experimental site to determine how Cypripedium fasciculatum responds to certain treatments, it could be ignored, it could be partially protected, or it could be totally protected.

## Monitoring

The ideal goal for monitoring protected sites is to sample each year for five years, following the discovery of the site. At most sites, counting plant numbers and marking the edges of the population is sufficient. However, whenever possible, detailed habitat information, using the Ecodata format (or the format used by the Area Ecologist for the Forest on which the population occurs), should be collected as well. In addition, data on the life history or reproduction biology of the plant should be collected during the monitoring if possible. If plant numbers are stable or predictable after five years, the monitoring goal would be to sample in alternate years, or on some other regular schedule, such as for three consecutive years every five years (sampling in years six, seven, and eight). Gathering data on three consecutive years may provide additional data regarding trends.

As a minimum, this management plan requires that population numbers are sampled at each protected site at least once every five years.

## Implementation and Review

This plan needs to be reviewed by all of the districts on the Rogue River National Forest (Ashland, Applegate, Prospect and Butte Falls Ranger Districts), by the Illinois Valley and Galice Ranger Districts of the Siskiyou National Forest, and by the North Umpqua Ranger District of the Umpqua National Forest. The Siskiyou-Rogue River National Forest Sensitive Plant Species Coordinator and other appropriate staff from the Siskiyou, Rogue River and Umpqua National Forest Supervisors Offices should review this plan as well. Once it is reviewed, it should be signed at the Forest Supervisor's Offices, and implemented at the Ranger Districts. The State of Oregon and the Oregon Natural Heritage Data Base will help review implementation of this plan in 1991 if it can be signed off by then. Support could include aid in implementation of the monitoring.

The overall plan should be reviewed at a meeting of all the Ranger Districts involved, five years after it is implemented, which would be in approximately 1995.

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